Obesity may protect against benign brain tumors

We hypothesize that the hyperinsulinemia of obesity, adipose derived hormones, or perhaps elevated lipids might be capable of disrupting the Warburg effect or otherwise inhibiting the growth of benign brain tumors.

Data are from the following sources:

- Report of obesity prevalence from Centers for Disease Control Ref. [2]. Obesity is defined as body mass index (BMI) of 30 or greater.

There was a significant inverse correlation between percent obesity versus percent brain tumors in 19 US states (r = 0.666, p = 0.002).

One hallmark of obesity is a reduction in sensitivity to insulin [3]. Obese subjects have higher fasting insulin levels and show lower insulin sensitivity than the non-obese.

There is considerable evidence that insulin is capable of shrinking tumors. For example, Salter et al. found that insulin may cause inhibition in the growth of malignant tissue [4]. Johnson and Wright showed that glucagon alone or in combination with insulin markedly inhibited a spectrum of transplantable murine neoplasms [5]. Insulin was apparently disrupting the Warburg effect, a metabolic derangement that causes most cancer cells to produce energy by a high rate of glycolysis [6].

A second inhibitor of benign brain tumor growth in obese subjects might be the adipocyte-derived hormones, for example, adiponectin, resistin, plasminogen activator inhibitor-1 (PAI-1), TNFs, IL-6, leptin, or estradiol (E2) [7]. Indeed, the presence of progesterone receptors, even in a small number of tumor cells, is a favorable prognostic factor for meningiomas [8].

Conflict of interest

None declared.

Reference


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Zinc lozenges for the common cold: Should we ignore the side-effects?

Sir,

We read with great interest the article by Eby [1]. We agree with the author that ionic zinc content of the lozenges may be one of the factors responsible for the beneficial effect in common cold. Some other relevant negative factors include zinc lozenges producing side-effects and compromising the compliance as well as masking, higher than therapeutic dose of zinc being used in some of the trials, etc. [2,3]. First one (side-effects compromising compliance as well as masking) may be responsible for the varied effects in these trials.

In the recent review [4], we included 14 double-blind placebo-controlled trials in the analysis of side-effects of zinc formulations (lozenges or syrup). The data was entered into Review Manager 5 for analysis, and odds ratio (OR) with 95% confidence interval (CI) was calculated. P-value < 0.05 was taken as significant. We found that, zinc lozenges are more likely to produce side-effects than syrup formulations. The results were as follows: any side-effect [lozenge, 2.15 (1.36–3.38) (P = 0.001) versus syrup, 1.03 (0.64–1.66) (P = 0.9)]; bad taste [lozenge, 3.24 (2.25–4.67) (P < 0.0001) versus syrup, 1.15 (0.55–2.39) (P = 0.71)]; nausea [lozenge, 2.46 (1.56–4.89) (P = 0.0001) versus syrup, 1.24 (0.50–3.08) (P = 0.64)]; diarrhea [lozenge, 2.09 (0.92–4.75) (P = 0.08) versus syrup, 1.34 (0.30–6.09) (P = 0.7)]; dry mouth [lozenge, 1.42 (0.95–2.11) (P = 0.09) versus syrup, 1.13 (0.43–3.01) (P = 0.8)].

To conclude, in addition to analysis of various formulations of zinc, importance should also be given to the side-effect profile,
ACI and MACI procedures for cartilage repair utilise mesenchymal stem cells rather than chondrocytes

So that the trial results may be uniform. This will further clarify the usefulness of zinc in common cold and optimal duration of use for therapeutic benefit with minimal side-effects.

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References


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ACI and MACI procedures for cartilage repair utilise mesenchymal stem cells rather than chondrocytes

Mature articular cartilage shows only a limited capacity for repair due to the lack of inherent repair mechanisms. For younger patients with focal articular cartilage defects, there is increasing interest in the potential of cell-based strategies to provide a biological replacement of damaged cartilage [1]. Autologous chondrocyte implantation (ACI) has been used for the repair of focal cartilage defects combined with a membrane sutured to the edge of the cartilage defect [2], or alternatively, the cells are embedded in a collagen matrix (MACI) [3]. These procedures involve harvest of normal cartilage from the patient, digestion of tissue and release of cells assumed to be autologous chondrocytes that are then expanded in culture ex vivo. When a sufficient number of cells have been obtained, these cells are inserted back in the cartilage defect. Mesenchymal stem cells (MSCs) are a self-renewing cell population derived from the mesoderm that exhibits an ability to undergo multilineage differentiation into many cell lines including chondrocytes under appropriate culture conditions [4]. MSCs have been isolated from many different adult tissues including bone marrow, and more recently, albeit in small numbers, cartilage [5].

We hypothesise that these cartilage derived MSCs, rather than mature chondrocytes, represent the cell source for ACI and MACI procedures. The ACI procedures predate the discovery of MSCs in cartilage and we believe that this is why the cells were assumed to be chondrocytes rather than MSCs. The protocol used to isolate and expand cells used for ACI and MACI procedures is similar to that used for MSCs [2,4,5]. There are also a number of further similarities between the cells used for ACI and MACI procedures, and cartilage derived MSCs. Both kind of cells are low in number, and this is likely to be adversely affected by age and deteriorating health, they are not easy to extract, have slow cell expansion in culture, and lose their ability to proliferate with prolonged expansion [5–8]. Chondrogenic differentiation of MSCs requires environment cues that the cells used in ACI and MACI procedures are provided with after reimplantation in the cartilage defect [9]. Results with MACI suggest that the cartilage repair tissue improves with time also suggesting that these cells are more likely to be MSCs rather than quiescent chondrocytes [10]. We suggest cell surface characterisation of the cells used in ACI and MACI procedures to see if they express markers characteristic of MSCs including CD44, CD90 and CD105.

References


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Concerns about dextromethorphan as a potential rapid-acting antidepressant

We read with great interest the study by Lauterbach [1] in which the author proposed an insightful hypothesis that dextromethorphan has the potential to be a fast-acting antidepressant. We appreciate the hypothesis proposed, and would like to add few predictions relevant to this article.

First, the author proposed that further researches are needed to test the rapid-onset of antidepressant effect within days after